

**Issue 10
June 2016**

IN THIS ISSUE

What is STEM? STEM: More Than An Acronym	1-2
North Dakota Collaborative Spring Conference: Remarks from Superintendent Baesler	3-4
North Dakota Space Grant Consortium Holds Annual Near-Space Balloon Competition	5-6
Integrating Native Culture into STEM	7-8
Topsy-Turvy Teaching	8
Native American-based Mathematics Materials For All	9
Habitats of North Dakota	10-12
Habitats of North Dakota to Teach the Scientific Method	13-14
A Maker Play Space	15-16
STEM in the Classroom Provides a Break for Kids	17
University of North Dakota School of Medicine and Health Sciences Center for Rural Health	18
Pyramids on the Prairie: Arts Integration as an Approach to Teaching and Learning in Mathematics	19-20
University of Mary Scholarship Opportunity	21
Project Armchair	22-23
You are Invited to Project Lead the Way: Administration Day at NDSU!	23
Upcoming 2016 State and National Conferences	24-25
Resources	26
Grant Opportunities	26
Call for Educators and Students	27
MSP Reminders	27

What is STEM?

The definition of STEAM has been debated in various sectors nationally and locally. Featured in the next several issues of the STEAM newsletter will be STEM and STEAM experts from North Dakota who will share their thoughts on STEAM education. This month we feature Molly J. Bestge, 21st century education leader and consultant, and CEO of Cultivate21. If you would like to learn more, Molly will be speaking at the 2016 Fall Educators Conference in October.

STEM: More Than An Acronym

By: Molly J. Bestge, 21st century education leader and consultant, and CEO of Cultivate21



STEM—STEAM—STREAM. All of these acronyms! Educators are synonymous with using our “education-ese” and abbreviations as nouns and verbs in our complex sentences as we have conversations with our colleagues in education. But, what does STEM really mean in the context of what we do daily with our students in our classrooms? My definition of STEM goes way beyond the obvious science, technology, engineering, and math.

There are a lot of educators who think they are “doing STEM” with their students. I have a hard time with that phrase, “doing STEM.” Is STEM just the types of activities we facilitate in our classroom? Is STEM the units we develop? Is STEM something I “do” with my students? Is STEM only about robotics and coding? Is STEM simply the subject areas represented in the acronym? What truly makes STEM? As I think more about it and my life as a STEM educator, I believe that STEM is an experience.

The STEM experience is multi-faceted and is far more than one-time STEM activities or simple “cookie cutter” projects that facilitate surface-level thinking. STEM uses Project-Based Learning (PBL) as the preferred instructional strategy to get at deep analysis and thinking. STEM PBL uses the Engineering Design Process (EDP) as the vehicle for process thinking as an integral part of the problem-solving process. Teachers develop relevant and meaningful projects that teach and assess the standards from multiple disciplines and encourage real-world problem solving. Any teacher in any discipline can (and should) use standards-based PBL as an instructional strategy in his/her classroom, but I feel the STEM experience can only happen through well-planned standards-based PBL that includes the EDP as the glue to the STEM experience.

STEM: More Than An Acronym, continued

Within the STEM classroom and beyond, students should be immersed in a culture of innovation, encouraged to take risks and fail in order to ideate and iterate on the road to creative design and problem-solving. The learning activities in a STEM PBL should facilitate the use of the EDP for the actual problem-solving process that leads to a viable solution to the real-world problem.

Our students crave relevance in their problem solving. They aren't stupid. They know when a project is "fake" or "made up" by the teacher. They want real problems that are "for reals." They want their solutions to make a difference. They want their voices to be heard. They want the choice to create solutions that utilize their gifts and talents. Student voice and choice matter within a culture of support. There is no stopping the outcomes of a powerful STEM PBL experience when you have passionate, empathetic students who truly believe that their solutions can make an impact on their world.

Embedded within a strong STEM PBL experience are the critical 21st century skills of critical thinking, communication, collaboration, and creativity—the 4Cs. In my many conversations with business and industry leaders across the country, they have shared with me the importance that their employees possess and can apply these critical 21st century skills in daily work activities without being prompted or trained. Possessing these skills is what makes someone "employable." The difference between staying employed in the 21st century will come down to how well a person can harness these skills in daily work life.

21ST
CENTURY
LEARNERS

You see, STEM is way more than an acronym. It's the experience of interconnected learning that allows students to use process thinking to be engaged in creating solutions to real-world problems. Let's move from just "doing" STEM activities to creating meaningful and worthwhile STEM experiences for our students. That will be what truly prepares a workforce ready to handle the rigors of what business/industry is craving in their future employees. These are the things that are really "for reals."

[*Cultivate21*](#) provides high-quality professional development experiences in STEM/STEAM, PBL, and 21st century best practice across the region and nation.



North Dakota Collaborative Spring Conference

The North Dakota Collaborative Spring Conference was held in Grand Forks from Thursday, April 21 through Saturday, April 23. Approximately 600 individuals attended the conference and opening activities. The film *'Most Likely to Succeed'* was also shown during opening activities.

The following pages are devoted to the conference. Included are Superintendent Baesler's opening remarks, along with various articles by speakers who presented at the conference.

Remarks from State Superintendent Kirsten Baesler, April 22, 2016

Good morning. It's great to be in a place that is so on fire with enthusiasm for teaching. My name is Kirsten Baesler. I am the North Dakota Superintendent of Public Instruction. Thank you for inviting me to speak at this collaborative spring conference. Last I heard, we have over 123 registrants from over 32 districts represented. On behalf of Russ Ziegler, Beth Larson-Steckler and me, the North Dakota Department of Public Instruction wants to thank the many great partners in this event:

- North Dakota Council of Mathematics
- North Dakota Science Teachers Association
- North Dakota STEM Network
- University of North Dakota STEM Initiative
- North Dakota Council of the Arts

Thank you, also, to the fantastic conference chairs and the many, many volunteers it took to put this conference together.

As we talk about collaboration, this conference is truly integration and collaboration in action. Thank you!

Some participants got a head start yesterday with pre-conference networking sessions and an evening full of events on the UND campus. And the agenda for the next two days is packed with speakers and breakout sessions that will help us grow together as fresh ideas "take root."

Integrating the core subjects in education has been a passion of mine for my entire career as a teacher, technology integration specialist, administrator, and school board member. And now, I have the good fortune to work for promotion of STEAM education as the superintendent of public instruction.

One of the things I am most excited about is something we began working on to bring to North Dakota my first year as state superintendent. The National Math + Science Initiative (NMSI) is a nationally recognized non-profit, public-private partnership that focuses on science, math and English to strengthen STEM instruction and education in our schools.

NMSI had programs in more than 20 states when I began conversations with them in 2013, but it didn't have a presence in North Dakota. In November 2015, we were finally able to announce a grant award from Exxon Mobil/XTO for over \$13 million to bring NMSI to North Dakota for training for elementary, middle and high school teachers across North Dakota.

Toni Schneider from NMSI is here with us this week and will be doing a session on the *"Laying the Foundation"* training. NMSI brought this training to North Dakota last summer and will again be holding the training this summer for teachers. I am confident that because of this initiative we're going to see more of our students taking advanced exams in STEAM disciplines.



Remarks from Superintendent Kirsten Baesler, continued

Educators and private companies are making this investment because they know students who have a solid grounding in science, technology, engineering and math are well prepared for life. They are equipped to solve problems. They know how to think logically and rationally. They are better able to evaluate risks, and they have much of the background we need for our leaders and policy makers of tomorrow. Our North Dakota economy is hungry for employees with STEAM backgrounds.

This conference is especially important because of its emphasis on collaboration. We can't have these separate worlds of science and math and engineering and technology.

First of all, it's not practical. We're a small state. We shouldn't have separate conferences where the different disciplines can't meet and talk to each other. We must bring everyone together. So instruction can be integrated. We can't have silo-based education any more. It is conferences like this one that push us toward the more cooperative and collaborative approach that we need. We all need to work together.

The future of education is the type of integrated, project-based learning this conference will be promoting. We know when our students go out into the world, they will need a combination of the skills STEAM education promotes.

They're not going to be on a job saying, "Well, now I will do 50 minutes of math. This afternoon, I'll do 50 minutes of science. Then I'll spend 50 minutes doing some writing or speaking." The world does not work like that.

It is no longer enough to have students sit in a classroom for rote learning and memorization. We must show our students how to apply what they know to real-world projects. The prime minister of the Organization for Economic Cooperation Development who regularly releases the PISA and TIMSS rankings says it best. "The world is no longer rewarding our young people for what they know – Google knows everything. The world is now only rewarding our young people for what they can **do** with what they know."

When I look through the conference program, I see all sorts of examples of this type of integrated learning and it gladdens my heart. We are emphasizing different ways to learn, and we are showing how STEAM education is important in all kinds of disciplines. There are a number of endless ways we can show the relevance of STEAM education to the lives of our students, and we can have fun doing it.

In all of this we cannot forget art. Art can and should be used with STEAM disciplines. One of your lunch speakers today is Amelia Terrapin who will bring to us a group of third graders who take the stage to put the solar system in motion through dance. This is a powerful and simple learning tool that is especially suited to students. And of course, in STEAM, we also need the beauty of art. We need imagination. We need color and form. We need creativity. We need these things as members of the human race.

If anyone doubts the need for creativity, imagination, and art in this 21st century, I encourage you to read Daniel Pink's book, *A Whole New Mind: Why Right-Brains Will Rule the Future!* Mr. Pink presents a compelling argument that creativity has become the competitive difference in our world-wide economy, along with the movement in management that creativity and innovation have high business value.

So, I'm excited to start this day! Our conference program is full of good information about how to improve our STEAM instruction and programs in North Dakota for our students!

Thank you for your time and attention. Thank you for choosing teaching, and may God bless all of you.



North Dakota Space Grant Consortium Holds Annual Near-Space Balloon Competition

By: Marissa Sand, Coordinator, NASA ND Space Grant Consortium

About the North Dakota Space Grant Consortium (NDSGC)

The North Dakota Space Grant Consortium (NDSGC) is a NASA-funded educational program headquartered at the University of North Dakota (UND) in Grand Forks that encourages K-12 and higher education STEM activities. The NDSGC sponsors college-level scholarships, research fellowships, and NASA internships, which better prepare North Dakota students to enter the STEM workforce. In addition, the NDSGC offers opportunities for K-12 educators, providing pre- and in-service educator workshops for professional development credit, as well as fun learning opportunities, such as funded trips to NASA's Educators Space Camp.

Near-Space Balloon Competition (NSBC)

The NDSGC holds their annual Near-Space Balloon Competition (NSBC), an engaging launch program available to all middle and high students in North Dakota. Since 2011, students have gained hands-on experience with the scientific and engineering design process, while having fun. Students have four months to fulfill NASA's Project Life Cycle. They create a hypothesis, design, construct, and launch a payload on a high altitude balloon. This balloon, which expands between 30 to 40 feet in diameter, rises high into the stratosphere, bursts around 100,000 feet, and descends back to Earth via a parachute. After joining the chase teams and tracking the balloon with GPS, students locate the payloads and gather their experiments. Returning back to the classroom, these young scientists analyze their data and produce a final report.

Every year, the mission objective for NSBC changes. Students may have to design a payload that would fly on a pre-cursor mission to an asteroid, Mars, the Moon, or beyond. The 2015 NSBC mission objective required students to conduct a pre-cursor trip to Mars. They conducted their research, designed an experiment to analyze the Martian atmosphere, and presented their conclusions in a final report.

The imagery they bring back marvels everyone. They see the curvature of the Earth, the darkness of space, and the appearance of the thin blue atmosphere. Students realize that anyone can be a scientist, you don't have to work solely for NASA, but with this experience you may just end up down that career path one day.



High school students captured this image during the 2015 NSBC. At 100,000 feet, our balloon resides over 99% of the Earth's atmosphere and experiences temperatures as cold as -70 degrees Fahrenheit!

North Dakota Space Grant Consortium Holds Annual Near-Space Balloon Competition, continued

Costs and Prizes

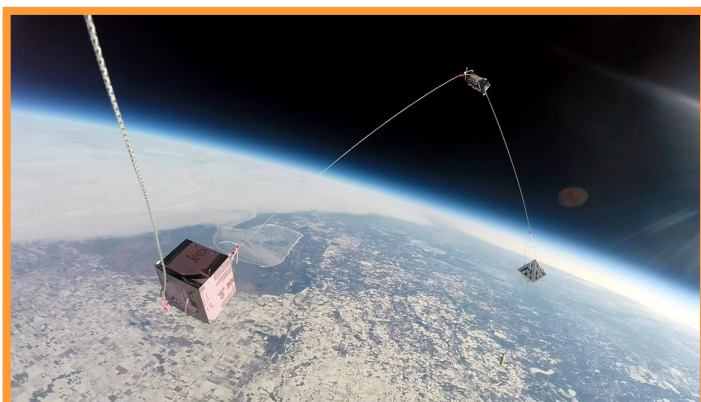
The NSBC comes at **no cost to schools**. The NDSGC reimburses all teams' travel and bussing costs, hotel bills, per diem (food), and payload construction materials. Each team receives up to \$250 to purchase materials for their experiment. To conclude the competition, faculty and graduate student judges from UND select a winning team. Judges examine many different factors, including students' proposals, payload functionality, methodology, team work, and final report.

The grand prize winner gets the opportunity to participate in a NDSGC-funded STEM field trip (ex. Gateway to Science Center, Fargo Air Museum, Ronald Reagan Minuteman Missile Site, etc.) or a trip to the John D. Odegard School of Aerospace Sciences at UND. The trip to UND includes a tour of the Aviation facilities, Human Space Flight Laboratory (space suits, spacecraft simulators, and Interplanetary Habitat and Rover), and the UND Observatory.

Getting Involved

Students and teachers have found this competition to be fun, educational, and memorable; many return year after year. The NDSGC hopes to reach communities across North Dakota, involving as many students as possible. Past participating towns include: Cavalier, Bismarck, Burlington, Des Lacs, Grand Forks, Kindred, Mandan, Mayville, Northwood, Portland, and West Fargo.

We invite all STEM educators and academic groups to contact balloons@ndspacegrant.org with any questions. Check out the [NSBC](#) website and learn more about the [NDSGC](#). NSBC's 2016 Call for Proposals will be announced in early September.



The 2014 NSBC student teams took this image after the balloon burst, capturing the curvature of the Earth, darkness of space, and other student payloads.



Middle School students hold their payloads before this 2013 high altitude balloon launch.



Integrating Native Culture into STEM

By: Richard Sgarlotti, Ed.S., Retired Math/ Science Teacher and Math Coach from Hannahille Indian School

Richard Sgarlotti, Ed.S., is a retired mathematics/science teacher and math coach from the Hannahille Indian School, located on a Potawatomi Reservation in Michigan. He is chair of Educators of Native American Students (EONAS), a special interest group within the National Council of Teachers of Mathematics. He is also the author/editor of "*Creating a Sacred Place for Students in Mathematics*" published by the National Indian School Board Association, and the basis for this session at the STEM Collaborative Conference.

Integrating Native Culture into STEM

Creating "Sacred Places" means responding appropriately to students' academic, social, emotional, physical, and spiritual needs. Improving the teaching of Indian students and empowering them to learn must address these needs. The research is quite clear on the matter. If Indian students are to be empowered to learn, their school programs must include four characteristics (*Cummins, Jim, 1986 Empowering Minority Students: A Framework for Intervention. Harvard Educational Review, v56 n1 p18-36*):

1. Language and culture must be incorporated into the school program. Considerable research suggests for minority groups experiencing school failure, the extent to which students' language and culture are incorporated into the school program constitutes a significant predictor of academic success.
2. There must be an unbreakable bond between school and community. When educators involve parents as partners in their children's education, parents communicate to their children a positive attitude toward education that leads to improvement in the students' academic achievement. Students can become empowered only when education becomes a true community enterprise involving an equal partnership between educators at school and educators in the home, the children's families.
3. Appropriate instruction must be provided. Research indicates the learning difficulties of minority students are often caused by the way we teach them. These students frequently receive intensive instruction that confines them to a passive role and induces a form of "learned helplessness." In contrast, the experiential-interactive model of instruction focuses on giving students hands-on classroom experiences that provide students with a basis for understanding more abstract academic curricula. The experiential-interactive model entails an additive orientation toward students' cultures and languages, an openness to collaborate with community resource persons, and active use of written and oral language skills.
4. Appropriate assessment must be provided. Minority students are over represented in special education because of improper testing. The primary focus should be on remediating the educational interactions that Indian children experience.

Much of the material from the book and the session are linked on the [EONAS](#) website. This website provides teachers and others with background materials and example activities for mathematics/STEM units for students in grades PK-12. They are aligned with the standards and, at the same time, are making instruction more meaningful to Native students. The units can be taught in a multidisciplinary approach and contain the ingredients necessary for a school to develop its own culturally-based curriculum.



Integrating Native Culture into STEM, continued

Each unit:

- Has a literature introduction based on Native culture-biography, story, or other reading, many by Indian and other authors who write books for and about Indians. Books should be reviewed by local Indian people to be sure they are appropriate, especially if they are about their tribe(s).
- Has one or more activities that can be done over a period of one to two weeks, related to the story, many using manipulatives or computer activities.
- Has real life problems that go with the activities.
- Is related to one or more of the standards.

The units are related to one or more of the following topics:

- [Indian Contributions to Mathematics](#). Include topics of Mayan and other tribal number systems, some of which are base five or base twenty; and counting in Native languages.
- [Mathematical Concepts in Traditional Culture](#). Include topics of “Mathematics as the science of patterns” in beadwork and weaving.
- [Mathematical Concepts in Present Day Cultural Activities](#). Include descriptions of pow wows, cooking and recipes, and casino games (traditional games such as two-sided dice).
- [Mathematics as the Language of \(Indian\) Science](#). Include activities of measuring, designing, and building housing, astronomy (Lakota Star Knowledge).
- [Mathematics in the Study of Indian People](#). Includes history, culture, location, and movement of tribes, and census numbers.
- [Indian Mathematicians/Scientists-Past and Present](#). Includes the builders of Mayan pyramids and Cahokia mounds, modern day scientists such as Fred Begay and John Herrington, and mathematicians such as Robert Megginson. Also use local tribal people.



Topsy-Turvy Teaching

*By: Barry Olson, 8th Grade Earth Science Teacher
Ben Franklin Middle School*

Barry Olson and Katie Crowdus presented two sessions called “Topsy-Turvy Teaching” at the 2016 North Dakota Collaborative Spring Conference for Math, Science, and NDSTEM on April 22 and 23. The Ben Franklin Middle School’s eighth graders taught science lessons to Washington Elementary School’s fifth graders using video lectures, hands-on labs, labs sheets, and assessments they designed. Visit [Topsy-Turvy Teaching](#) for more about the program and hand-outs.



Native American-based Mathematics Materials For All

By: Miles Pfahl, Mathematics Instructor, Turtle Mountain Community College

Infrequently mentioned in most mathematics instructional settings is the U.S. is a parallel, rich system of mathematics developed and used by indigenous people of North America. This project has developed a series of 17 classroom-ready mathematics lesson plans that can be used in various areas of mathematics courses taught in our K-14 education system.

These materials allow instructors to infuse culturally relevant and interesting mathematics activities into their courses and classrooms. These materials also not only allow Native American students to be more fully involved in their learning, but also gives all students a fuller appreciation of the universal nature and power of mathematics.

A team of mathematics and cultural experts worked in unison to develop these materials in a way that shows respect for the culture from which they are developed. In Native cultures, stories (oral communication) are the basis for passing on information and knowledge. These mathematics lessons start with the story and the mathematics is pulled from the content of the story, not the other way around where the mathematics is forced into the culture.

This project researched and developed mathematics materials which are based in the cultures of the Native American peoples from across the U.S. These materials are classroom ready, each with an introductory PowerPoint presentation, student lesson plan, and instructor guide. These lessons cover various mathematical concepts that coincide with traditional math contents in K-14 education and give additional perspective as to how traditional math topics can be incorporated into real world situations in the Native American culture. These lessons are not meant to take the place of any traditional math course, they are meant to serve as supplemental materials to give a Native American perspective to topics already being taught in traditional courses.

Mathematics topics covered in the lessons include number theory, numeration systems, topology, measurement, probability and chance, statistics, data mining, and geometry. These lessons are meant to expose students and instructors to Native American traditional mathematics and intellectual traditions. They have been developed, piloted, and edited over a period of three years and have been disseminated at numerous local, state, and national mathematics conferences.

OK, enough already, you want to see the lessons right? A Facebook page and [project website](#) have been developed which can be used to access the project information and lesson plans. To find us on Facebook, do a search for Native American Based Mathematics Materials for Undergraduate Courses. The Facebook page gives a brief description of the project and contains the link to access the actual lesson plans.

The 17 lessons are in Microsoft Word format, so they are editable. Feel free to change, use as much or as little of each lesson as you see fit. These lessons were developed by a team of mathematics and cultural experts from across the U.S. and convey the mathematics and culture of a specific Tribal Nation. Each Tribal Nation in the U.S. has its own unique culture and traditions and the lessons that have been developed come from these specific Nations. If you are from a different Tribal Nation or are in close proximity to another Tribal Nation, feel free to adapt the lesson to your area. We welcome any feedback you are willing to give.

Enjoy!!



Habitats of North Dakota

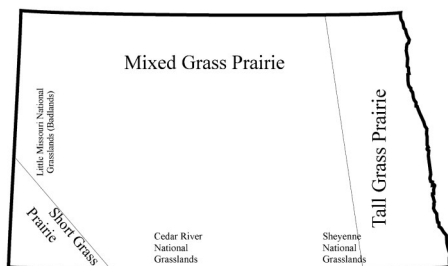
By: Sherry Niesar, M.S., Curriculum Specialist, Outreach & Education Section, North Dakota Game & Fish Department

The Habitats of North Dakota program (HND) is part of the fourth grade studies curriculum and meets the fourth grade standards for North Dakota Studies and third through sixth grades standards for Life Science. The HND program materials are available to educators through the North Dakota Game & Fish Department at no charge. For more information about obtaining the materials contact [Sherry Niesar](#).

There are five distinct habitats in North Dakota. They are Prairie, Riparian, Badlands, Woodlands, and Wetlands. Each habitat has unique flora and fauna and are identified by landforms and their location within the state.

A **prairie** is a large, treeless region covered with grasses and forbs, or wildflowers. North Dakota lies in the heart of the Prairie Pothole Region, which includes the potholes and prairie lands created by the Wisconsin glacier. In North Dakota, we have the tall grass prairie found in the eastern third of the state, the mixed grass prairie located in the middle of the state, and the short grass prairie found in Southwestern North Dakota. See Figure 1.

Figure 1: Prairie types found in North Dakota.



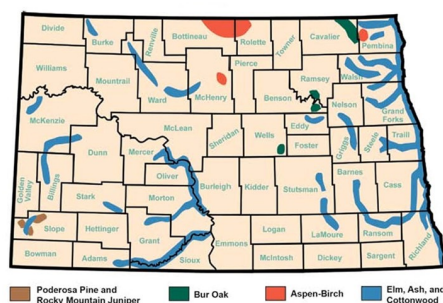
Riparian habitat, riparian area, or riparian zone, is the area of vegetation (plant life) that borders and is influenced by a stream. The root word of “riparian” is a Latin word meaning “bank of a river.” So think of any flowing water like a river or stream and the land on either side of the flowing water. This is the Riparian habitat. It includes both terrestrial and aquatic life. (Figure 1)

Figure 2: Rivers and large lakes and reservoirs of North Dakota.



Badlands are one of the most unusual areas in North Dakota and are located along the Little Missouri River in the southwestern part of the state. Because of its location along this river, the area is also referred to as the “Little Missouri Badlands.” The Badlands are about 20 miles wide and about 150 miles long. They extend from the South Dakota border to Lake Sakakawea and cover about four percent of North Dakota. They are known for their great natural beauty. Many shades of red, yellow, brown, black, and green color the unusual landforms. Early French trappers and explorers who came to the area called this area “bad land to travel across,” which led to the name “Badlands.” (Figure 2)

Figure 3: Woodland areas of North Dakota



A **woodland** is land covered with woods or trees. North Dakota is a prairie state, but almost two percent is woodlands. North Dakota does have native forests that are naturally occurring forests. They were not planted by humans. Three major kinds of forests make up the native forests of the state: lowland, deciduous forests, upland. Ash, oak, elm, and box elder trees are common along the river corridors. The riparian areas formed by the trees are very important for wildlife, water quality, and beauty. The category of each kind of forest is determined by the location of the forest and the species of trees that are dominant. Rural plantings include trees planted in farmyards, windbreaks, shelterbelts, and living snow fences. Protection from the wind is of high importance to people living on the prairie. (Figure 3)

Habitats of North Dakota, continued

A **wetland** is a basin, or low area of land, that holds water. Some wetlands hold water for only a few days or weeks, while others are filled with water year round. The Prairie Pothole Region is known for its rolling hills and its millions of potholes. Some people in North Dakota call potholes “sloughs” (slews). The Prairie Pothole Region covers about 300 thousand square miles, as it is about 1,000 miles long and about 300 miles wide. The area includes large parts of Alberta, Saskatchewan, Manitoba, North Dakota, South Dakota, Minnesota, and Iowa. Because the Wisconsin glacier did not cover the southwestern corner of North Dakota, that area of the state is not part of the Prairie Pothole Region. North Dakota lies in the heart of the Prairie Pothole Region. The Prairie Pothole Region is the greatest producer of waterfowl in the world.

Figure 4: Prairie Pothole Region



An ecosystem is an area that contains organisms (living things) interacting with one another and with their non-living environment. If one part of the ecosystem is changed or destroyed, it has an effect on everything else in that community. Within each habitat there are plants and animals that are uniquely suited for that habitat by habits or adaptations. Additionally, each habitat is faced with a unique set of threats impacting the habitat. Threats are based on the location of the habitat in North Dakota and the natural resources that are found in the habitat. It is important to note that while each habitat is unique, there is overlap between habitats. Think of them as puzzle pieces that fit together seamlessly. Animals that are confined to an aquatic environment such as wetland, lake, reservoir, or river are confined to only that habitat. To remove them from the water would mean they would die. Terrestrial animals that can travel throughout North Dakota often move between different habitats such as wetlands, prairie, and woodlands. While the Badger’s primary habitat is the prairie, it can also be found in other habitats as well.

Figure 5: Habitats Graphic Organizer


Activity:

1. Students are given background information from the habitats guides.
2. Students are divided into groups. About three-four students per group with five groups. If desired, the students may work independently.
3. Each group selects a habitat and animal and claims the habitat and animal by writing them on the board. No group may have the same habitat or animal.

A sample group listing might be:

<u>Habitat</u>	<u>Wildlife Species</u>
Wetlands	Canada Goose
Riparian	Bald Eagle
Prairie	Badger
Woodlands	Moose
Badlands	Bobcat

4. Students are given a specific amount of time to learn about the animal, habitats and threats to the habitat. By researching their topic each group becomes the expert. The Habitats Graphic Organizer (Figure 5) is provided to each students to keep their research focused.
5. Each group presents their findings on their habitats to the remaining four groups. Questions are often generated from this presentation resulting in discussion.

<p>1. Description of Animal <i>How is this animal suited for its primary habitat?</i></p>	<p>2. Food Sources</p>
	
<p>Name of Animal: _____</p> <p>Animal's Primary Habitat: _____</p> <p>Description of Primary Habitat: _____</p>	
<p>3. What are the threats to the primary habitat? <i>How do these threats affect your animal?</i></p>	

Habitats of North Dakota, continued

Assessment

1. Students should be able to provide a description of all habitats presented and two threats to each habitat.
2. Students will be able to identify animals that live in each habitat.

Extension

1. Students can take their research and complete a:
 - PowerPoint presentation
 - Build a scientifically correct diorama
 - Poster depicting threats to the habitats
 - Do a three-panel cartoon about the habitat

References

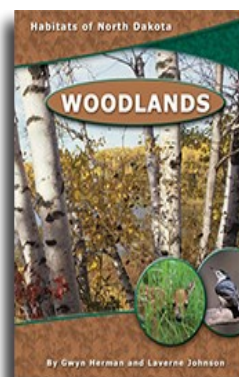
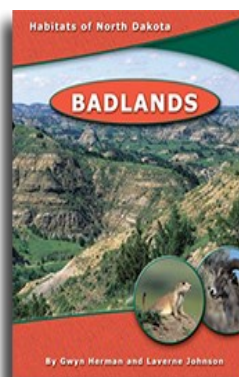
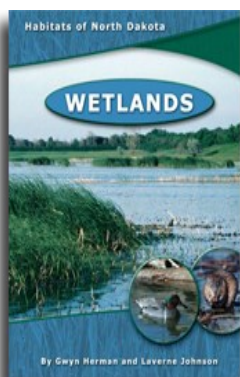
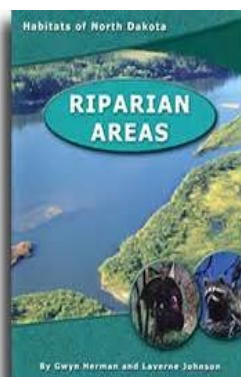
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Habitats of North Dakota to Teach the Scientific Method

By: Sherry Niesar, M.S., Curriculum Specialist, Outreach & Education Section, North Dakota Game & Fish

The Habitats of North Dakota Program (HND) is part of the fourth grade studies curriculum and meets the fourth grade standards for North Dakota Studies and third through sixth grade standards for Life Science. While meeting standards for specific grade levels and content areas, the HND program has been successfully utilized from K-12 grades, in resource rooms, and special education. The HND program materials are available at no charge to educators through the North Dakota Game & Fish Department. For more information about obtaining the materials, contact [Sherry Niesar](#).

Background

There are five distinct habitats in North Dakota: Prairie, Riparian, Badlands, Woodlands and Wetlands. Each habitat has unique flora and fauna and are identified by landforms and their location within the state. By researching a unique habitat, students will determine, perhaps with guidance, what can be measured on the habitat, gathering real data to employ the scientific method.

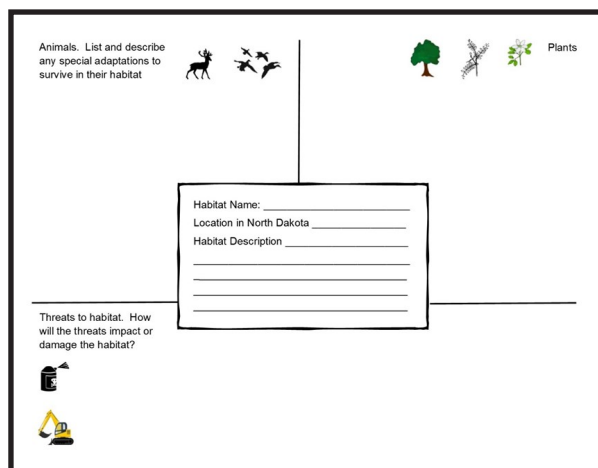
When conducting research, scientists use the scientific method to collect measurable, empirical evidence in an experiment related to a hypothesis with the results aiming to support or contradict a theory. Before developing a hypothesis, students must learn about their habitat so they can ask intelligent questions. By using the graphic organizer below (Figure 1) students focus their research on the habitat.

Figure 1: Scientific Method - Habitats Graphic Organizer

Once students have researched the habitat of their choice and completed the graphics organizer, they are ready to move to implement the scientific method.

The Scientific Method

1. Make an observation or observations. This is the research you have completed with the graphic organizer.
 - ◆ Ask questions about the observations and gather information.
 - ◆ Write three questions about your observations. Questions should be things you can learn with the equipment and skills you have available to you.
3. Form a **hypothesis** and make predictions based on your observations, information gathered and questions you wrote in step 2.
 - ◆ How to develop a hypothesis:
 - ⇒ A **hypothesis** is an educated prediction that provides an explanation for an observed event. An **observed event** is a measurable result or condition. If you can't measure it, then you can't form a hypothesis about it because you can't confirm or reject it. In addition, a hypothesis typically takes the form of an if-then statement so you can test it with your research.
 - ⇒ Make sure your hypothesis is a specific statement relating to a single experiment.
 - ◆ Hypothesis Examples:
 - ⇒ The number of song birds is greater in the Woodland habitat than the Grassland habitat. *This hypothesis can be measured by counting the number of different song birds in each habitat. Students do not have to be able to identify the species of bird.*
 - ⇒ The Wetland habitat has greater mammal species diversity than the Prairie habitat. *This hypothesis can be measured by counting the number of different species students observe as well as physical evidence left behind by the mammals (scat, tracks, fur, lodges).*
 - ⇒ The air temperature is colder during the winter months in Woodland habitat than in Prairie habitat. *This can be tested by taking temperature readings in the two different habitats over a period of time.*
 - ⇒ Write your hypothesis.



The graphic organizer is a rectangular box divided into four quadrants by a central cross. The top-left quadrant is labeled 'Animals. List and describe any special adaptations to survive in their habitat' and contains icons of a deer, a bird, and a fish. The top-right quadrant is labeled 'Plants' and contains icons of a tree, a flower, and a leaf. The bottom-left quadrant is labeled 'Threats to habitat. How will the threats impact or damage the habitat?' and contains icons of a factory, a car, and a person. The bottom-right quadrant is a central box labeled 'Habitat Name: _____', 'Location in North Dakota: _____', and 'Habitat Description: _____' with several lines for writing.

Habitats of North Dakota to Teach the Scientific Method, continued

- ◆ Describe your experiment. What equipment will you need, how often will you collect data and what data will you collect?
 - ◆ Test the hypothesis by setting up an experiment to test the hypothesis. Conduct experiment and collect data.
4. Collect data. (Use data as collection sheet)
 5. From your data and field observations, write conclusions based on results of your experiment. You may accept or reject your hypothesis.
 - ◆ Was your hypothesis correct? Why or why not? Explain.
 6. Share your results. You may share your results in a poster, report, PowerPoint, movie, or oral or written report.
 7. Can you reproduce your experiment with the same results? To truly be scientifically accurate, the experiment must be able to be repeated with the same results.

Assessment

1. Students will describe the steps to the scientific method.
2. Students will write a hypothesis.
3. Students will be able to design an experiment based on the scientific method.

References

- Herman, Gwyn S. & Laverne A. Johnson (2008) Habitats of North Dakota: Riparian Areas. North Dakota Center for Distance Education: Fargo, ND.
- Herman, Gwyn S. & Laverne A. Johnson (2008) Habitats of North Dakota: Wetland Areas. North Dakota Center for Distance Education: Fargo, ND.
- Herman, Gwyn S. & Laverne A. Johnson (2008) Habitats of North Dakota: Prairie Areas. North Dakota Center for Distance Education: Fargo, ND.
- Herman, Gwyn S. & Laverne A. Johnson (2008) Habitats of North Dakota: Badlands Areas. North Dakota Center for Distance Education: Fargo, ND.
- Herman, Gwyn S. & Laverne A. Johnson (2008) Habitats of North Dakota: Woodlands Areas. North Dakota Center for Distance Education: Fargo, ND.




Life Sciences

A Maker Play Space

By: Jeremy Holkup, EduTech



“Play is
the
Highest
form of
research”

~ Albert Einstein

On June 22, 2016, my co-workers and I had the privilege of setting up a Makerspace area for the amazing educators that attended the NDCTM and NDSTA STEAM Conference.

If you have never heard of a Makerspace before, it is an area designed for people to create, invent, and learn. They can be big or small. It is up to your imagination and creativity the items you have in them. In our traveling Makerspace, we brought many items for educators to explore and learn about.

Our Maker Play Space consisted of items spread all around the room with challenges for educators to try and complete as they learned about the item. Meanwhile, we would float around, answer questions, and assist teachers as needed.

Educators that came to our Maker Play Space got to experience computing on a Raspberry Pi as well as connecting it to an Arduino microcontroller.

Educators were able to get their hands on our 3-D printer and prepare objects for printing. They drew pictures and used color codes for our color reading robots called Ozobots.

A crowd favorite was programming the Rolling Spider Drone and the challenge to create the code to navigate a Sphero through an obstacle course.

They enjoyed building a maker arcade with cardboard, playdough, and anything else that was conductive to hook up to our MakeyMakeys. They constructed and blew bubbles using our magnetic circuit LittleBits. They even assembled LEGOs that they were able to program using simple block coding with the LEGO Education WeDo set.

A Maker Play Space, continued

Educators were also able to experience virtual reality using Google Cardboard. They were able to explore areas all over the world, like Italy, or experience games in a virtual environment, like fixing neurons inside the human brain.

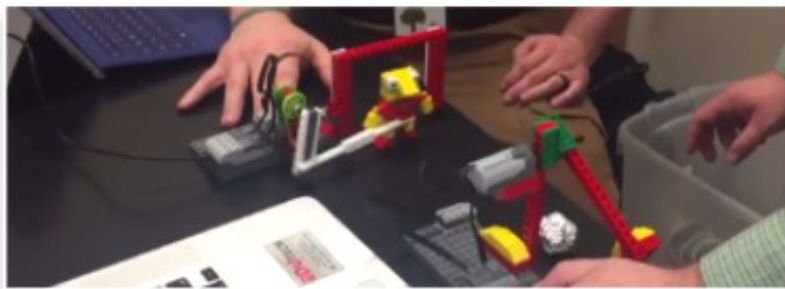
We had over 170 educators drop in, play, and learn about all the things our Makerspace could offer. I loved hearing all the ways they talked about incorporating the different items we had into their classroom curriculum. If you have any questions or need help getting your Makerspace started, feel free to contact me! I look forward to attending this conference again next year.

Makerspace Resources

Everything we shared and learned about that day and even more can be found at our [EduTech website](#). You will also find all our contact information at that site if you would like us to answer questions or come to your school.

Special Thanks

I can't take credit for all the great learning that happened in our Maker Play Space. Paul Jensen, Steven Deziel, and Kelly Rexine were crucial in the success by being available to help answer questions. We are all former teachers that work for North Dakota's EduTech division. We get to teach teachers all over the state about technology. Without their help, I wouldn't have been able to have this session at the conference.



STEM in the Classroom Provides a Break for Kids

By: Sarah Boese and Joseph Ostgarden, Science Teachers, Red River High School, Grand Forks, North Dakota

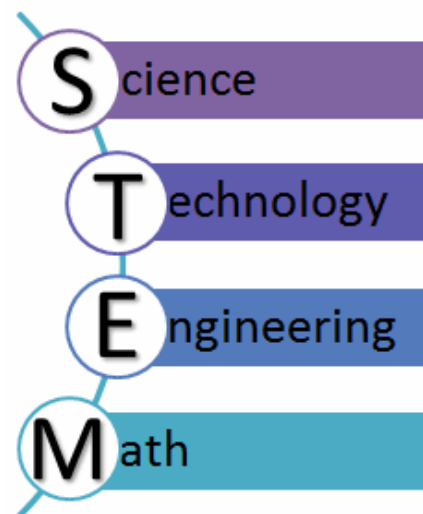
Education is currently on a new trend at Red River High School (Grand Forks, ND). Science teachers, Sarah Boese and Joseph Ostgarden, wanted to create a project that would incorporate their ninth grade physical science students into the realm of STEM. So they planned for a year on a PBL (project based learning) that would incorporate what their students have learned about physics to solve a real-world problem. According to Buck Institute for Education, a PBL is “a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an engaging and complex question, problem, or challenge.” Their problem: to create a playground that would generate energy to provide electricity for a facility.

How does one create energy?

First, students had to research and understand how a generator functions. Then, students had to create a simple motor using kits that were purchased through the Grand Forks Foundation Grant. Next, the students had to create a blueprint of what their K’nex kit would look like as a piece of playground equipment, which led to the building phase. While students were building their initial playground plan, they were visited by engineering students and professors from the University of North Dakota, local engineers, and school administration. With the critiques and feedback from their visitors, students were able to modify and present their final designs to the engineers and school administration.

How is this beneficial to student(s) education?

This PBL was an opening into real engineering design and practice. At a ninth grade level, students may not know what they want to do when they grow up, but creating projects that open their eyes a little more to what’s available is beneficial. Students were surveyed after the project and many had great responses. One student said this PBL “was REALLY fun and it was really hands on. I think a lot of people learn that way. Also we were learning stuff while still doing something fun. It was also very original. Most teachers don’t do this kind of thing so it was a nice change.” Another stated, “I was able to think of ways through the energy process to make the United States a better place with energy building. And I also summarized the fact that we can make energy without pollution in the air and toxic chemical to solar power energy today.” Students were willing to try out the PBL and excited to come to class. What a great change of pace to see students collaborating, communicating, and using their problem solving skills efficiently.



Overall evaluation of project: What went well? What we would do differently?

Students demonstrated successful problem solving during this project in comparison to the regular labs that are completed during our physical science class. The ability to bounce ideas off each other while communicating different views in their groups and reinforcing teamwork was an extremely beneficial outcome from the project. In the future, we are planning to implement a better focus on assessing their knowledge and understanding of energy transformations. We are also currently looking into new materials to supplement the K’nex kits as well as involving more professional experts to guide students’ final projects. We would also like to share our PBL to other physical science classrooms across our district next year.

If you would like, please contact [Sarah Boese](#) or [Joseph Ostgarden](#) about their PBL.

University of North Dakota School of Medicine and Health Sciences Center for Rural Health

*By: Kylie Nissen, BBA, Senior Project Coordinator, Center for Rural Health
University of North Dakota School of Medicine and Health Sciences
Executive Director, North Dakota Rural Health Association*

The Center for Rural Health (CRH) at the University of North Dakota School of Medicine and Health Sciences works with K-12 educators to provide resources for instructors to use when educating on health and health careers. There are numerous events, activities, and resources available throughout the year. Events include Scrubs Academies and Scrubs Camps that show students what health careers are out there, HIPE Week, and National Rural Health Day. The CRH also offers HIPAA certification for 6-12 grade students, resources to use in your classrooms, and websites with links to teaching tools.

R-COOL-Health Scrubs Camps are one-day events focused on rural students in grades 5-12 held between October 15 and April 30 of each year. The overall purpose of the program is to increase awareness, interest, and understanding of health careers available in rural North Dakota through creative and interactive activities. Each year grants are disseminated to rural communities that form partnerships consisting of (at a minimum) local/regional K-12 school system(s), health care entity/facilities (e.g., hospital, clinic, long term care facility, EMS/ambulance squadron, local public health unit, etc.), and the local economic development and/or local job development authorities. Community grantees are responsible for coordinating the camp within the guidelines put forth in the grant guidance.

The Scrubs Academy is an expanded version of the Scrubs Camps. It is an opportunity for North Dakota students to participate in numerous sessions covering a multitude of health careers led by local health professionals, instructors, and college students. The Scrubs Academy I is a four-day, three-night program for students who have completed grade six, seven, or eight where the students stay on the University of North Dakota Campus in Grand Forks. Each year students apply to attend this Academy. Applications are due each year in February.

The CRH has a number of health care professions educational items for loan, and we encourage their use. The goal is to provide tools to encourage the interactive learning and grow student's interest in health care professions. Items include such things as In-A-Box curriculum, Glow Germ with Light, Occluded Artery, various posters, Sneezzy Sam, a giant inflatable colon, In-A-Boxes, and more! There is no charge to the borrowing facility for this service except for any shipping cost to return the materials.

In many institutions, students are not allowed to enter the clinical setting as part of their job shadowing/scrubs camp/course work, until HIPAA training has been completed. Therefore, all students that come in contact with personal health information as part of the educational process should complete HIPAA training. North Dakota students grades 6-12 can complete online HIPAA training through the University of North Dakota School of Medicine and Health Sciences' Center for Rural Health. They receive a HIPAA Basic Training Certificate upon completion. Training takes approximately 30 minutes to complete and is free of charge.

Additionally, the K-12 Teacher Resources website puts teachers in contact with the CRH items available for loan and resources that are useful when planning curriculum and health career related events. These resources include suggested books for elementary students, coloring contest tips and pages, interactive hands-on ideas for health career awareness, a coloring book, healthy snack recipes, posters, table tents about different health careers, and handouts for students to help in planning courses to take in high school and selecting a career. It also provides numerous electronic resources that may be helpful when planning career education activities or events, links to the CRH projects, and links to various external links and resources for teachers who have an interest in health care.

For questions about any of these programs, or to learn more about what is available, visit [Center for Rural Health](#), or contact [Kylie Nissen](#).

Pyramids on the Prairie: Arts Integration as an Approach to Teaching and Learning in Mathematics

By: Bonnie Tressler and Emma Mickelson

Under a bright blue May sky, 44 students and 11 pieces of art work moved to “Emotional Clockwork,” music by Michael Schoening. Third grade students from Washington Elementary and fourth grade students from Louis L’Amour Elementary in Jamestown showed their audience what they had learned through their studies of the elements of art (color, line, shape, form, texture, and value) and geometry (transforming nets from 2-dimensional shapes to 3-dimensional solid figures).

This event was made possible by a three-year professional development grant from the North Dakota Council on the Arts and the hard work and perseverance of the STEAM Team in Jamestown.

What is arts integration? STEAM vs STEM? Enhance vs integrate? These are some of the initial questions that had to be answered before our team could move forward with an effective plan. To find the answers, books such as Making Thinking Visible by Karin Morrison, Mark Church, and Ron Ritchhart; Studio Thinking by Louis Hetland, Ellen Winner, Shirley Veenema and Kimberly M. Sheridan; and Artful Handbook (a joint project of the Minneapolis Public Schools and The Perpich Center) were read, discussed, and critiqued. Conferences were attended at the Kennedy Center in Washington, D.C. (Arts Integration-Exploring an Approach to Teaching), and annual STEAM Team workshops were held in Bismarck sponsored through the North Dakota Council on the Arts.

The Kennedy Center’s definition of arts integration was adopted by the team:

Arts Integration is an APPROACH to TEACHING in which students construct and demonstrate UNDERSTANDING through an ART FORM. Students engage in a CREATIVE PROCESS which CONNECTS an art form and another subject area and meets EVOLVING OBJECTIVES in both.

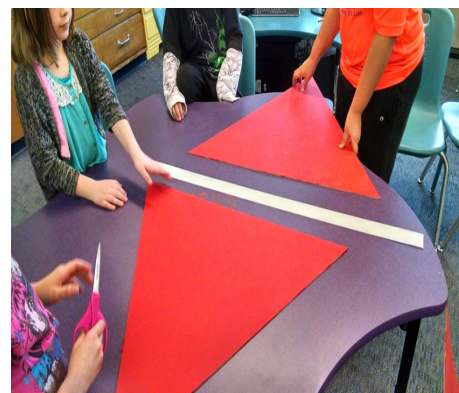
“Teaching all the subjects through the lens of the arts in a more dramatic, hands-on way – is going to attract students, hold their attention and give them the thinking skills kids need to survive in the new global economy” - Sean Layne, Kennedy Center

Once a month, team meetings took place for a full day of brainstorming and discussion on assigned readings and how to best teach the math and art standards. New math materials and manipulatives were explored. Arts materials were used to create art and explore art history. The grant allowed the purchase of many of these supplies for use in the classroom.

The team didn’t focus on creating a math “unit” to be taught. Arts integration is much more to us. We started out three years ago with a blank math unit lesson plan. We struggled for several grueling meetings to formulate a unit that would truly be arts integrated. We never



doubted the need for a concrete plan, but this format wasn’t working for us. Something was missing. A team member shared that to be comfortable teaching the arts and integrating the arts she had to get comfortable with them herself. It was an “ah-ha” moment, our professional development emphasis became exploring the arts as a team. Every meeting included a two-hour art lesson. The goal was to create art.



We returned with passion to the Kennedy Center’s definition of arts integration, each subject to be integrated must be taught authentically and thoroughly before true arts integration can happen. As soon as we changed our emphasis, arts connections to the math standards were obvious.

Pyramids on the Prairie: Arts Integration as an Approach to Teaching and Learning in Mathematics, continued

We explored many lessons in executing the pyramid project; several of these lessons were incorporated into the project, and several serve to prepare the team for even greater innovations in teaching. The art lessons, focused on graphic artist Romero Britto, were chosen not only because we felt his use of bright colors, bold lines, and patterns were very student friendly, but also because in 2007 he created a [45-foot tall pyramid in London's Hyde Park](#). This eventually led us to creating a large pyramid with the help of sign maker Newman Signs, a Jamestown-based business, as a final project.

We have seen the results of this process in our own practices and in the learning of our students. We have applied for and received a second grant to continue our professional development. Please visit: <https://youtu.be/ArB8p3QQQhg>.





UNIVERSITY OF MARY
America's Leadership University

Scholarship Opportunity

School of Arts and Sciences
Department of Biology

Greetings from the U Mary Biology Faculty!

We want to make you aware of an exciting opportunity available to low-income seniors who are interested in a career in the areas of wildlife/conservation biology or environmental science. The Biology Department recently received a generous S-STEM grant from the National Science Foundation to fund our ECOWEB Program (Expanding Career Opportunities in Wildlife and Environmental Biology). This program provides both academic and financial support to students, as well as provides them unique opportunities to build relationships with scientists and employers in the areas of wildlife/conservation and environmental biology.

Some specific highlights of the ECOWEB program include that it:

- Provides **scholarships of \$8,000-10,000/year** for four years to students with financial need majoring in wildlife/conservation biology or biology with a minor in environmental science at U Mary.
- Broadens student experience by providing opportunities to be involved in research and internships, participate in citizen science projects, visit a graduate school and attend a professional conference.
- Supports student success through one-on-one faculty and peer mentoring. Program advisors are experts in wildlife/conservation biology and ecology/environmental science.
- Connects students with wildlife conservation and environmental science professionals to build professional relationships, allow students to explore career options, and expand their knowledge.

To qualify for an ECOWEB scholarship, a candidate must be a U.S. citizen, national, legal permanent resident or refugee alien, be a full-time student with a declared biology major with either a wildlife conservation biology concentration or environmental science minor, demonstrate financial need based on the FAFSA, have a minimum high school GPA of 3.0* and math ACT score of 25*, submit 2 letters of recommendation, one of which must be from a high school science or math teacher, and participate in an interview with the Selection Committee. (*Although these are optimal criteria, the Selection Committee will consider candidates scoring below these thresholds if the candidates demonstrate strengths in other areas of consideration.)

For more information, or to apply, students can visit our website at ecoweb.umary.edu, or contact any of us at the email address or phone number listed below. We'd be happy to visit with you and/or interested students!

If you have any students you think would benefit from this scholarship program, we'd really appreciate you making them aware of this opportunity. Thank you in advance for your help, and please don't hesitate to contact us if you have any questions!

Sincerely,

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mnordlie@umary.edu
701-355-8148

Michael T. Lares, PhD
ECOWEB Co-PI and
Program Advisor
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Program Advisor
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701-355-8380

Project Armchair

By: Vonda Dahl, Reading Interventionist and Instructional Strategist

Project Armchair is a volunteer-based organization comprised of certified teachers from the Bismarck-Mandan area. Our purpose is to read quality children's literature aloud to children in crisis within the Bismarck-Mandan communities. Project Armchair was launched in the fall of 2015 by Mandan reading interventionist and instructional strategist, Vonda Dahl, who began reading to children at both the Welcome House homeless shelter, and to patients on the pediatric floor of Sanford Hospital.

The objectives are multi-pronged: a. bring literacy to kids who are in need a little boost (a child in the hospital is not a child at school); b. model fluent and cognitive reading for the child; c. further literacy by gifting the book to the child; and (most importantly) d. provide a moment of pleasurable escapism from challenging circumstances through the power and magic of rich children's literature.

As colleagues began hearing of Vonda's experiences, they asked if they, too, could become involved. Many were looking for a volunteer opportunity that utilized their education gifts and professional passions. There are currently sixteen Bismarck-Mandan certified teachers in various stages of the hospital/shelter orientation processes.

To date, approximately two hundred books have been gifted to children in crisis in our communities. Project Armchair will soon have a teacher on the pediatric floor almost every night of the week, year round.

Immediate plans include adding a lending library for middle and high school patients to the teen lounge on the pediatric floor. This library will feature texts recommended by researchers, librarians, and most importantly, teenagers themselves. Another pilot project to be launched during the summer months is reading to young patients at bedtime to help alleviate nighttime fears and anxiety.

Sanford Hospital's administration and nursing staff have been overwhelmingly supportive of Project Armchair's services. Maureen Bentz, Director of Maternal Child Services for Bismarck Sanford Hospital says, *"The kids love it, the families love it, and the nurses and doctors are all so proud that we are able to offer this to our patients. You and your team have done an amazing job and we couldn't be happier that we have established a partnership with you. Being hospitalized can be such a "911 moment" for kids and their families. Our goal is to make them feel safe while they are getting better, and you have been so instrumental in helping us create that experience for our kiddos and their families."*



Area organizations have helped fill the need for book donations. The Mandan School District has been collecting books to donate to Project Armchair since February. St. Mary's High School FBLA held a book drive in February. Bismarck's Legacy High School also held a book drive. And many, many individual donations have propelled Project Armchair forward and allowed it to continue its services.

Volunteers have shared many stories of watching children in crisis, even the very ill, light up while listening to the reading of an engaging story. Parents are delighted to see those rare smiles, and for a brief moment, illness, fears homelessness, and confusion are forgotten in the pages of really good story.

Project Armchair, continued

Mandan's Welcome House family homeless shelter has also embraced Project Armchair's services. The shelter venue offers the opportunity to read to the same children over a course of weeks, or even months, affording the child the opportunity to accrue several books appropriate to their age, grade, reading level, and interests. Beginning in June, Project Armchair volunteers will offer parenting classes for the shelter's parents, to share research on the multiple benefits of reading aloud to children, model what "reading for meaning" looks and sounds like and, of course, give away books! In the fall of 2016, we will also add tutoring services at the shelter for school-aged children.

Please visit the [Project Armchair blog](#) for more information.

Follow them!



Vonda Dahl is available to speak to your school or group about Project Armchair!

Project Armchair
PO Box 826
Mandan, ND 58554

✉ projectarmchair@outlook.com
☎ 701-426-8828



Teachers Reading Aloud to Children in Crisis

You are invited to Project Lead the Way: Administration Day at NDSU!

Project Lead The Way is the nation's leading provider of STEM curriculum and is meant to engage and inspire K-12 youth to pursue STEM careers.

The North Dakota State University's (NDSU) College of Engineering has partnered with Project Lead the Way (PLTW) to provide high-quality teacher professional development training, identify grants to pursue, and create an engaged network of educators and corporate partners to better serve our students.

On Wednesday, August 3, 2016, from 8:00 a.m. to 1:00 p.m., NDSU College of Engineering and Project Lead the Way will be hosting the 2nd Annual PLTW Administration Day, where administrators can come learn more about what the teachers have done this summer. Engineers in industry will also be on campus that day, so administrators and industry members will be able to collaborate during the provided lunch.

This is an opportunity to find out more about PLTW, develop partnerships with companies, and learn to implement and sustain the program within your school.

Attendance is free. Please [RSVP on Eventbrite](#) by July 25, 2016. Share this information with anyone in your district who would be interested in attending.

If you have any questions, you can contact [Holly Erickson](#) or call (701) 231-7697.

Upcoming 2016 State and National Conferences

SAVE THE DATE!

UNITED TRIBES TECHNICAL COLLEGE

**2016
JULY 25-29**

**PRAIRIE ROSE PROJECT
SUMMER YOUTH CAMP**
UTTC CAMPUS | BISMARCK, ND

**UTTC
STREAM
SCIENCE
TECHNOLOGY
RECREATION
ENGINEERING
ART
MATHEMATICS**

The Prairie Rose Project Summer Youth Camp is for Native American students living on reservations who will be entering the 9th grade.

Campers will engage in various activities that focus on the STREAM curriculum areas (Science, Recreation, Technology, Engineering, Art, & Math) and are taught by professional educators.

There is no cost to attend camp.* Campers will be provided all meals and will lodge in secured dorms located on UTTC campus.

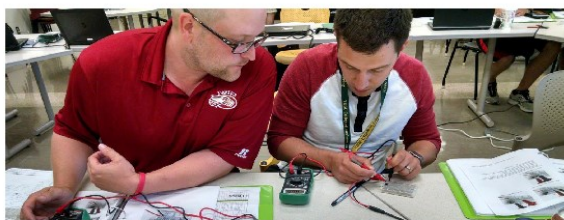
Openings are limited, so register early!

To request more information contact:
Jennifer Held, Administrative Assistant
Phone: 701-221-1428 | Email: jheld@uttc.edu

*Funded by the Prairie Rose Project, an Office of Indian Education, U.S. Department of Education, Demonstration Grant

PROJECT LEAD THE WAY CORE TRAINING

North Dakota State University
July 25 to August 5, 2016



Please join us for Launch, Gateway and Engineering core training. Master teachers will lead interactive, hands-on training focused on implementing best teaching practices and using new equipment.

Participants also will have the opportunity to learn about cutting-edge research from faculty members in NDSU's College of Engineering and see what industry partners offer Project Lead the Way engineering classrooms.



NDSU COLLEGE OF ENGINEERING

SUMMER 2016 CORE TRAINING AT NDSU

LAUNCH 3-day session: August 1-3
Cost: \$495.00 (includes meal plan, parking, and tuition.)

GATEWAY 5-day session:
• Automation and Robotics August 1-5
Cost: \$1320.00 (includes meal plan, parking, and tuition.)

Computer Science 5-day session: August 1-5
• Introduction to Computer Science
Cost: \$1320.00 (includes meal plan, parking, and tuition.)

ENGINEERING 10-day sessions: July 25-August 5
Courses available:
• Civil Engineering and Architecture
• Principles of Engineering
Cost: \$2675.00 (includes meal plan, parking, and tuition.)

CREDIT
Professional credit is available for all sessions.

REGISTER
Registration for core training is scheduled to open mid-March. Visit pltw.org and select "Register Now."

Prerequisite: Readiness training

ACCOMMODATIONS
Hotel accommodations are available at Candlewood Suites near the NDSU Campus and Fargo airport. More information will be provided upon registration.

For additional information, contact:
• Affiliate director: Holly Erickson at holly.erickson@ndsu.edu or 701-231-7697
• Project Lead the Way: schoolsupport@pltw.org or 877-335-7589

Find the Afterschool
SUPERHERO
in YOU!

KEYNOTE
Dr. Donald Bartlette
"Macaroni at Midnight"

BREAKOUT SESSIONS:
David and the Keys, Mentoring, Dr. Donald Bartlette
Making Sense Parent Engagement, Julie Creedon
STEM Kids, Holly Erickson
Maker Movement, 3-D Printing, Shawn & Stephanie Grimes
U Code Girl, Betty Gronneberg
Aligning the School Day, STEM, Literacy, Judy Ha & Amy Shema
Social and Emotional Learners, Margo Herman & Kate Walker
STEM Network, Paul Kaidel & Adam Gehler
You CAN Do the Rubik's Cube, Bryan Kinkel
Leadership/Citizenship, Working on Reservations, Joshua Kukowski
Inspire Innovation STEM, Carrie Leopold
Math & Reading Party, Dr. Stephanie Pasley-Henry
Are You Their Superhero?, Yasleitz Rivera
Parent Cafes, Sarita Sasirington
Understanding Childhood Traumatic Stress, Laura Sotolowsky
Bullying, Generations, Monique Stelzer
Utilizing & Creating Transmedia Lessons to Engage Learners in PreK-2, Shania Winning
Break-Out Boxes, Lego Story Starters, Sandy Zahn

KIPPOW!

21st Century Community Learning Centers
SUMMER CONFERENCE
August 2-3, 2016 | Avalon West, Fargo

Register at:
https://www.escweb.net/nd_seec/catalog/conference.aspx?conference_id=29522

2016 North Dakota Fall Educators Conference

Plans are coming along nicely for the 2016 NDDPI Fall Conference to be held on October 12-14, 2016, at the Bismarck Event Center. The conference will feature two phenomenal keynote speakers and numerous breakout sessions.

Please note the following important fall conference details:

- The NDDPI has a dedicated website to display all handouts and information related to the Fall Conference. All [Fall Conference materials](#) can be assessed online.
- The NDDPI anticipates disseminating statewide correspondence that includes registration information in mid August.
- The fall conference is relevant for administrators, teachers, and counselors. There is literally something for everyone!
- In the fall, participants will receive correspondence outlining all of the scheduled breakout sessions. Participants will be asked to select those sessions they will attend so we can better determine presenters to avoid overcrowding.
- For any participants taking the conference for credit, information regarding the credit process and details will be available this fall. This conference can be used to renew Title I credentials.



The North Dakota Department of Public Instruction is sponsoring this conference in collaboration with the following:



**North Dakota Association
of Colleges for Teacher Education**

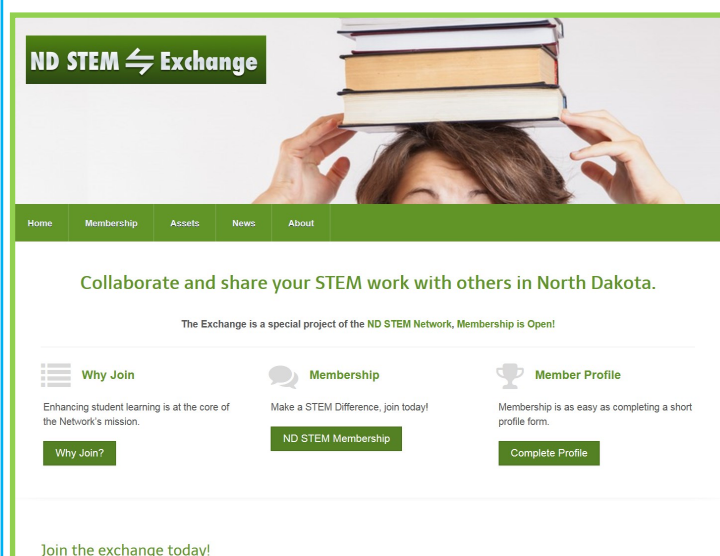


Resources

Math Leadership Project

The North Dakota Math Leadership Team has finalized its [Cross State Collaborative Math Modules](#). Please feel free to use these resources or seek the guidance from the North Dakota Math Leadership Team.

ND STEM Exchange Website



The ND STEM Network has had the ND STEM Exchange under development over the past two years. The ND STEM Exchange is now accepting profiles for individuals or organizations from all sectors (business and industry, higher education, non-profit, government agencies, etc.) that wish to share their STEM programs, resources, or expertise. Profiles are also being solicited for educators, formal or informal, seeking to connect with profiles to broaden the resources available to North Dakota students. Models in other states have clearly demonstrated that it takes a critical mass of profiles to make such an exchange productive in its purpose – to help resources reach intended audiences, and classrooms to connect with STEM resources and expertise. Please consider submitting your profile today!



Grant Opportunities

Toshiba

Grades 6-12. Next grant cycle: October 1, 2016

Honda

Grant cycle deadlines: February 1, May 1, August 1, and November 1

The Captain Planet Foundation

Grant deadlines: September 30 and January 31.

Sol Hirsch Education Fund Grants

Application for the 2016-2017 school year opened February 2016

The Verizon Foundation

This grant is by invitation only. Contact your Verizon Relations Manager in your area to learn more about this opportunity. (Site has a search engine to find your local Verizon Relations Manager)

Digital Wish Grants

Login to Digital Wish and submit a technology-based lesson plan for a chance to win over 50 different technology grants. Grants will be awarded on the 15th of every calendar month.

Call for Educators and Students: We Want to Hear from You!

Educators

We want to hear from educators in the field. If you are doing something innovative and exciting in the area of STEM/STEAM, please contact us. While North Dakota is a state in which there is usually one degree of separation, I know for a fact that there are innovative, exciting things happening in classrooms, libraries, and before and after school in the areas of STEM/STEAM that other educators are unaware of. This newsletter is a forum for educators to share what they are doing. Please consider contacting us about what you are doing. We would love to share it!

Students

Do you have a student who has excelled in the areas of STEAM? If so, please consider sharing this student and their accomplishments. The STEAM Newsletter will be featuring *Student Reflections* as a regular feature.

Please contact:

[Beth Larson-Steckler](#)

Office: (701) 328-3544

Fax: (701) 328-0203

MSP Reminders

- **Quarterly Report**

The lead agency is responsible for preparing and submitting the quarterly report. To access the template, click [quarterly report template](#). The quarterly report is due to the NDDPI on the following dates:

- ⇒ **September 26, 2016**
- ⇒ **December 2016**
- ⇒ **March 2017**
- ⇒ **June 2017**

- **Annual Progress Reports**

The annual progress report is due to the NDDPI by October 30, 2016. The lead agency is responsible for completing and submitting the annual progress report each year. To access the template, click [annual progress report template](#).

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